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Safetran Systems Corporation
Engineering Research
and Development Division
10855 7th Street
Rancho Cucamonga, California 91730
TEL. (909) 987-4573
FAX (909) 460-4177

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TO: Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 "M" St. NW, Rm 222
Washington DC 20554

Subject: FCC Decision on Automatic Vehicle Monitoring Systems, PR Docket No. 93-61 With Regard to 902-928 Mhz Band

Safetran Systems Corporation is a Railway Signal and Communications Supply company that has been in business since 1971 and as such is a Part 15 radio supplier in the 902-928Mhz spread spectrum band.

In addition, Safetran, has been a strong supporter and contributor to the Advanced Train Control Systems (ATCS) Association of American Railroads (AAR) project that started in 1984. About 5 years ago, Safetran decided to make use of the ATCS licensed frequency band ( six channel pairs in the 875Mhz and 935 Mhz band allocated to the railroads specifically for ATCS) to improve both railway safety and reliability by providing a building block scheme to achieve ATCS capability by replacing old obsolete physical code lines with the data radio. Safetran led the way in the use of this technology for central dispatcher office to wayside control of signaling equipment. This equipment is installed on almost every major railroad in North America and other suppliers have developed similar equipment. The railroads have been able to demonstrate a much greater reliability in controlling the wayside signals and are able to obtain wayside information with much greater reliability, accuracy, and speed, thus allowing a greater improvement to train delays as a result of having better real time information. This in turn enhances the safety of railroad operation by making sure trains travel on known aspects for movement authority and not have unnecessary delays due to code line outages that result in trains having to run by flagging rules at restricted speeds that increases the risk of collision and derailment type accidents. Also, when there is an outage, it is usually for only one small part of the railroad and not a hundred or more miles as in the case with the older code line control systems thus greatly increasing the reliability of service.

About 1992, Safetran saw another way that not only would enhance the safety of operation, but that would also provide a much more economical approach to implementing ATCS or similar communications based systems. Present day systems have been reliant on the coded track circuit and/or vital physical wayside pole line circuits to obtain the required signal aspects vitally for train movement authority. Safetran saw the need to enhance the ATCS network that was presently being implemented for on-board locomotive and wayside control of signals. It was recognized that not only was there a need for a wayside network that would eliminate the need for the vital wayside pole lines and coded track circuits, but also there was a need for wayside to train communications

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that could provide both continuous and more timely information capabilities. This would allow a number of improvements to the railroads by allowing for a much quicker reactive capability to wayside and on-board hazards, an alternate location system, continuous information capability for better reactive capability to speed enforcement, and a linear network along the wayside that would provide a much needed information network to collect maintenance and repair data.

In order to explore the development of such a network, Safetran conducted a number of tests with various Part 15 spread spectrum radios in the 900Mhz band from a number of suppliers that might have the capability of providing unlicensed data radio usage to accomplish the above tasks. This band was picked over the Part 15 2.4Ghz band because we already had good path data in that same spectrum as a result of our experience in the ATCS radio bands. This in fact did turn out to be the case and we chose to stay within the Part 15 900Mhz spread spectrum band; however, we were unable to obtain an off the shelf radio that would fit the timing requirements and that was robust enough to meet the interference requirements necessary to accomplish the task. With this in mind, two years ago, Safetran chose to design their own radio specifically for the above described applications. This radio is now complete and has been tested on a number of railroads under various conditions and configurations and has performed above our expectations. There is tremendous interest in the radio for railway applications that can bridge on to the same wayside Part 15 linear network. The problem that we now have is that the recent FCC ruling dated February 3, 1995, Report Order, PR Docket No. 93-61 has caused concern among our customers that if they install the 902-928Mhz radios, there will ultimately be an unacceptable limit of interference.

To further perplex Safetran's position, three years ago, we decided to emphasize our entire R&D program based on communications based signal and train control systems and we are about to come out with a series of products that are tied to the need for the Part 15 data radio that will provide channel space and capacity without the complications of obtaining licensed channels. We have literally spent millions of dollars in R&D funds to design and produce products, and this single decision could result in rendering our product strategy almost useless because our customers now feel that the proliferation of LMS usage will ultimately cause interference to our systems as well as increasing the possibility of our radios interfering with LMS systems. Also, it was opened for unlicensed use and the hierarchy in which it fell for ISM use fit the railroad applications very well. We were encouraged to use this band because of the relatively low use of high powered transmissions to contend with for interference. The decision made in 1974 didn't deal with the same reality that we are dealing with in 1995. Many of the companies including Safetran based their strategy on the density of use as it now exists, not on the explosive growth of the pending decision which will most likely cause the LMS applications to explode. The applications that Safetran has planned for the railroad market depend on providing uninteruptible radio systems in order to maintain safe and reliable railroad operations of the associated equipment connected to these radios. The railroads exist in all sorts of terrain that require antennas to be mounted at various heights on towers, poles and wayside structures that can be used to provide the best path propagation. They will

have to operate in inclement weather and severe environmental conditions and it is essential that we have the flexibility of antenna height variations necessary to accomplish this task.

The AAR chose not to take up this battle because they have another agenda, but the individuals that we have been working with on the railroads as well as our competitors see this as a major blow to making major improvements to the railroads both from a safety and economical side. It also is counter to everything that the Federal Railroad Administration/Department of Transportation (FRA/DOT) has been advocating with respect to transmission based systems. The FRA has emphasized the recent Railway Safety ACT (Public Law 102-365, entitled "Railroad Radio Communications"). This in turn has made the AAR take an even harder look at communications based systems and a major project is being undertaken by the Union Pacific and the Burlington Northern railroads referred to as PTS. While this particular project has not presented a completed set of specifications, it is concievable that spread spectrum radio could be a useful component added to the communications backbone system that already exists. Another report to Congress was published in July 1994 by the Department of Transportation/FRA that describes the future intent of the government with regard to signal and train control systems which are communications based. This report specifically refers to spread spectrum radio as one of the alternatives on page 49. Spread spectrum radio is ideally suited for the vital signaling and train control applications because it virtually prevents hackers from recording intercepted vital data signals and using the recordings to purposely interfere with the vital operation of signal and train control functions. There is also a need for moving block type systems within the transit industry which will require even greater access to channel space. It has also been brought to Safetran's attention that there are a number of research projects taking place that involve the use of spread spectrum for IVHS applications and safety involved with grade crossings in general. Without such capability, the rail and transit industry will only be able to go forward with limited ability to take advantage of modern technology to gain the improvements necessary to increase their throughput. Safetran has conducted enough investigations to know that direct wayside to train communications will be necessary and to obtain the licensed channel space to meet these requirements will be virtually impossible. Both licensed and unlicensed data radios will be needed to accomplish the best possible coverage needed to increase safety and performance. The 2.4Ghz spread spectrum space will also be needed to accomplish the many tasks that need to be carried out.

Safetran understands that a coalition was in place to protect these frequency bands, but did not participate directly because we did not think that there was a chance of such a decision. It is beyond our comprehension how a decision of this nature could be made when so many radio companies, and customer recipients are affected in such a denigrated manner. This decision while maybe helping some new useful service has literally affected many companies and the welfare of their employees and further limited the ability to increase safety, reliability, and efficiencies in the rail market. In Safetran's case, several years of R&D expenditure and time will be lost in the market due to having to start another strategy with another long design cycle. This is almost devastating.

We would like to see this decision to be reconsidered in order to allow similar and much more important improvements to be made to the railroad and transit industry. If this is not possible, we still see the need to obtain the use of a similar spectrum of frequencies with the same channel capacity and transmission speed capability.

We are very concerned that the proposed frequency allocation in the 902-928 Mhz band will introduce such congestion and interference as to render direct sequence modulation spread spectrum radio ineffective. As an alternate, we recommend that certain portions of this band be allocated for this type of low-power emission and transmission to take advantage of the inherent freedom from mutual interference offered by direct sequence modulated spread spectrum radio. If this is provided, it will offer railroads and other safety critical systems the ability to function effectively and efficiently in addition to protecting the significant investment which has been made in this highly promising telecommunication technology.

Sincerely,

Glen Wilson
Vice President and Chief Technology Officer--Safetran Systems Corporation